REMARKS

Claims 1-3, 5-12, 16-18 and new claim 21 are pending in this application. Claims 13-15 have been withdrawn and claims 19-20 have been deleted.

Because claims 19-20 have been deleted, the objection to the claims should be overcome.

The claim amendments and new claims are supported as follows: all currently amended claims (formalities corrections) and new claim 21 (based on claim 1 and p.14, lines 18-27).

Claim 1 is rejected under 35 USC 102(b) as being anticipated by **Ando '168**. Further, claims 3, 5, 6, and 8 stand rejected under 35 USC 102(b) as anticipated or obvious under 35 USC 103 over **Ando '168**.

The Office Action states (p.4, lines 1-3) that **Ando '168** does not expressly include a disclosure of the various channel layers respective bandgap/composition. With respect to claims 1, 12, new claim 21 and claims dependent therefrom, the first channel layer having the lowest energy level is provided next to the electron-supplying layer. In the high electron mobility transistor, i.e.) HEMT, when the distance between the gate electrode and the channel region with carriers is closer, the mutual conductance gm is larger. Therefore, the channel region with carriers is required to exist closer to the electron-supplying layer on which the gate electrode is formed. In contrast, in **Ando '168**, the channel layer having the lowest energy level is not closely provided to the electron-supplying layer. Therefore, in **Ando '168**, since the channel region with carriers is far from the gate electrode formed on the electron-supplying layer, the mutual conductance gm can not be as large as

the invention as now claimed in claims 1, 12 and 21. **Ando '168**, being chemically different, does not anticipate or suggest the claimed invention.

Claims 2 stands rejected under 35 USC 102(b) over **Ando '168** as anticipated or obvious under 35 USC 103 over **Ando '168** in view of **JP'898**.

JP'898 clearly suggests using P in the quaternary channel layer (FIGS. 1 and 2) while claim 1 expressly excludes element P. The first and second channel layers, of the invention as now claimed, do not include P. Whereas, in **JP'898**, the channel layer is InGaAsP which includes P. As explained in the specification on p.7, lines 22-27, if P is not included in the channel layers, the etching process of forming element isolation groove can be done in one process. Therefore the element isolation groove process becomes simpler. When P is included in any one of the channel layers, then the etching process for the element isolation groove needs poly different etching processes, or an ion-milling process which is a kind of compulsory removal process. Therefore the element isolation groove process becomes complicated. Claim 2 cannot possibly be anticipated or obvious in light of **Ando '168** in view of **JP'898**.

Claims 3, 5-7, 10-12, 16, 18 and 19 stand rejected under 35 USC 103 over **Ando '168** in view of **JP'898**. Claims 9, 17 and 20 stand rejected under 35 USC 102(b) over **Ando '168** as anticipated or obvious under 35 USC 103 over **Ando '168** in view of **JP'898** and further in view of the Applicants Admitted Prior Art.

With respect to the claims, the composition ratio of Al element, i.e (1-z), is 0.05-0.5, as explained in the specification p.16, lines 12-27. When the component ratio of Al is less than 0.05, ie $(1-z) < 0.05$, the energy level of the second channel layer becomes similar to that of the first channel layer, InGaAs, so that there is no effect to provide 2 different channel layers, whereas, when the component ratio of Al is larger than 0.5, ie $(1-z) > 0.5$, the energy level of the second channel layer becomes similar to that of the buffer layer, InAlAs, so that the carriers are not accumulated in the second channel layer, creating no substantial electron carrying effect in the second channel layer. **Ando '168** does not disclose or suggest the above composition ratio of Al element in the second channel layer and therefore does not make a logical rejection, even in combination with **JP'898**.

With respect to claim 21, the electron-supplying layer, the first channel layer and the second channel layer have Group III-V compound semiconductor being lattice matched to the InP substrate. Therefore, in the structure of the claimed invention, there is no limitation that the thickness of these layers should be less than the critical film thickness at which the lattice constant of the grown film are not changed. In **Ando '168**, the channel layers of InGaAs are not lattice matched to the GaAs substrate. Therefore, it is required to have a limited thickness, not being lattice mismatched to the substrate. As shown above **Ando '168** in view of **JP'898** is chemically different that the claimed invention and therefore does not anticipate or render obvious the invention now claimed.

The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **March 19, 2003**.

In view of the aforementioned amendments and accompanying remarks, claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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